



Laser quartz tube cutting provides fast and nearly flawless fire polished cuts. Each cut tube is precisely cut to length with a minimum of labor.

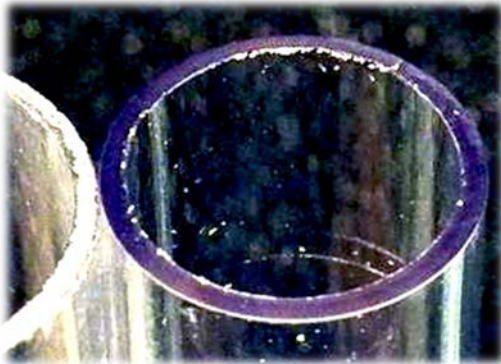


Figure 1: Laser Cut (right) and saw cut (left)

Quartz tubes revolve under the laser beam, as many as twelve can be set up in each pass of the machine. The system detects a tube, turns on the needed nozzle air and the laser beam. In a few seconds a beautiful cut segments raw tubes into lengths that repeat across the twelve tubes on the table. A single step at each position cuts and fire polishes.

Each 15mm diameter tube is cut and fire polished in six (6) seconds. Larger diameter tubes with thicker walls, are cut and polished in 10-15 seconds.

Benefits of laser cutting with our equipment include....

- 1 Raw tube stock can be quickly cut to length in house, avoiding long delivery times and large minimum orders from overseas.
- 2 The cut is very clean with a minimum of debris inside the cut tube.
- 3 The ends are not only fire polished, but straight. This can improve subsequent operations leading to significant savings.
- 4 The cut lengths are precise. This improves the product and can avoid material losses.
- 5 Different diameters and various wall thicknesses are easily cut.
- 6 Setup is easy.



Figure 3: Laser ON

Labor savings are not only found at the cutting step, but when tube segments of different materials need to be joined, the laser cut surfaces produce an excellent weld. Other lamp manufacturing steps benefit from straight, smooth and consistent cut ends and lengths.



Figure 2: Recent Install

Operation is automatic. Place tubes in the bed and when started the tubes rotate and the laser beam cuts them all and returns to the start position.

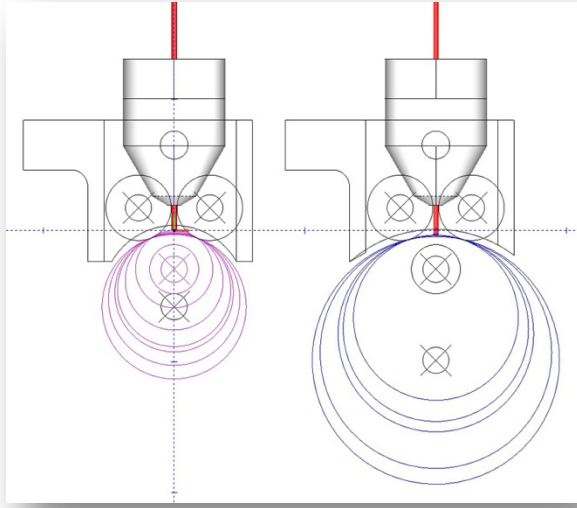


Figure 4: End view showing laser beam and Tube diameter

Each tube is laser cut by rotating under the laser focus. Surrounding the focus nozzle is a metal housing that prevents laser beams and debris from leaving the cut zone. This arrangement is not light tight, but restricts all reflected beams and secondary light to manageable levels.

Shown in this illustration are the different tube diameters that can be cut, rollers that track on top of each tube, and the nozzle that delivers pressurized air along with the focused laser beam to cut the quartz. Two different housings are provided so that all tube diameters can be accommodated.

Twelve smaller tubes (19mm dia and below) or six larger tubes are placed on the cutting bed. An electronic scale sets the end stop for precise cut lengths.

The laser is positioned over each tube in order, and the cut is made. If a tube is not present the machine will skip that one and move on to the next tube position.

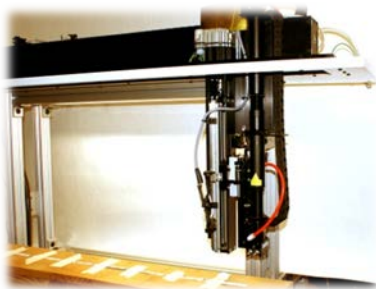
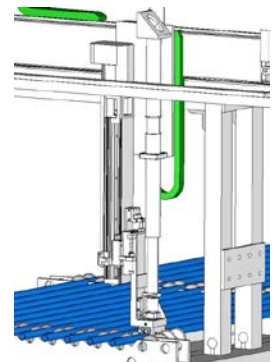


Figure 5: Cutting Head (In test bench)

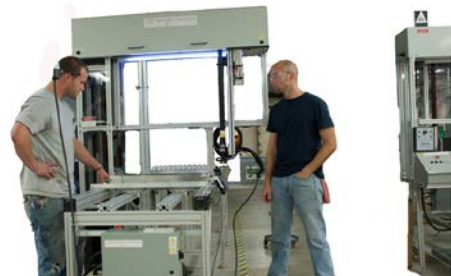
Each tube is checked for correct focus with a sensor so that all cuts are identical.

Tubes lengths up to 1.8M are easily fit on the cutting table. A fence with electronic readout sets the length and changing this length is simple. This fence, a TigerStop, is accurate to .004" (.1mm) and the laser cuts always in the exact same path so your cut lengths are precise and easy to set up regardless of tube diameter.



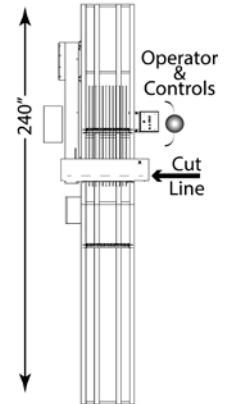
Our latest design is more compact as compared with earlier products. Shown here are two of our earlier machines, one being delivered and the other, to the right, was in production.

The design is proven with multiple units in a single facility.

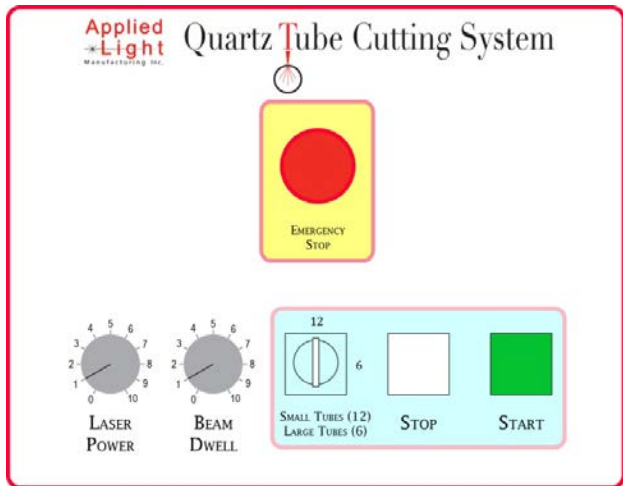


**Technical Specifications:**

- Electrical:** 208V 30A
- Shop air:** 40psi min pressure, clean and water free
- Venting:** Venting out of the building or into a filter is recommended. Filtration units can be quoted separately.
- Machine Footprint:** Top view shows overall length of 20ft. A shorter 10ft model is available.  
L x W x H: 240" x 52" x 67"
- Laser:** Max power 150W @ 10.6µm wavelength



**Operator Panel**



The operator panel photo is shown aside the design.

**Maintenance:** Focus lens requires periodic cleaning and replacement. Beam steering mirrors are longer lived but also need maintenance and occasional replacement. Lubricate the linear axes annually. Laser tubes typically last for 4,000 hours or longer.

**Service and Setup:** A service remote can plug into the Operator Panel - all motor and laser functions are switched to the remote when it is installed. Remote control of motors and laser power is used for beam alignment, machine setup and certain service needs.

**Sourcing:** The machine is designed and fabricated in the USA from domestic and foreign sourced parts. The laser is imported. Applied Light maintains an inventory of replacement components to support equipment in the field.

